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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,694	11/09/2001	Dietmar Johlen	112740-369	2975
29177	7590	10/22/2004	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			SINGH, DALZID E	
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			2633	

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/990,694	<b>Applicant(s)</b> JOHLEN, DIETMAR	
	<b>Examiner</b> Dalzid Singh	<b>Art Unit</b> 2633	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 November 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 5 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07 Agust 2002</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 6, 8, 9 and 11-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the branches" in line 3. There is insufficient antecedent basis for this limitation in the claim. Claim 6, depends on claim 4, which further depends on claim 1. Claim 1 recites a single branch, therefore it is unclear if claim 6 refers to more than a single branch.

Claims 8 and 9 recite the limitation "the step of combining" and "the passage" in line 3 of both claims. There is insufficient antecedent basis for this limitation in the claim. It appears that claims 8 and 9 should have been depending upon claim 5.

Regarding claim 11, in lines 6-8, the claim recites the phrase "and precisely one interleaver," and "and precisely one branch, having at least one influencing part, provided per frequency band" It is not clear if the claim is directed to multiple branches and/or multiple interleaver and/or multiple influencing part. Based on this, the claim appears to be indefinite for failing to particularly point out and distinctly claim the subject matter. It appears that this is repetition of phrase in the claim and therefore considered redundant. For the purpose examination, the claim has been treated as having a single branch, a single influencing part and a single interleaver.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 11 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Giles (US Patent No. 5,633,741).

Regarding claim 1, Giles discloses multichannels optical communications as shown in Fig. 1, for the frequency band-dependent distribution and frequency band-dependent influencing of data signals of a WDM system, the method comprising the steps of:

providing the WDM system (see abstract) with a plurality of channels which propagate in a bidirectional interleaved fashion and which have at least one frequency band between a first side and a second side (as shown in Fig. 1 and disclosed in col. 4, lines 50-63; the signals are transmitted in bidirectional fashion; Fig. 2, shows that the signals, transmitted on the bidirectional line (7), which comprises of bidirectional amplifier (8), are odd channels (f1, f3) and even channels (f2, f4). Since the signals are odd and even traveling in bidirectional fashion it is considered as bidirectional interleaved; the signals are transmitted between first side, where transmitter (1) and receiver (2) are located, and second side, where transmitter (4) and receiver (5) are located; the signal have at least one frequency band, such as (f1, f3));

directing all the data signals of the channels of a specific frequency band, coming from the first side and the second side, in a same direction via a single branch which is assigned to the frequency band and which has at least one influencing part (Fig. 1 shows directing data signal (f1, f3 and f2, f4) from the first side and the second side, which contain frequency band, in a same direction via a single branch (7) and which has at least one influencing part (since the bidirectional amplifier (8) influence the signal by increasing its intensity, the bidirectional amplifier is considered as an influencing part); and

forwarding all the data signals to the first side and the second side in accordance with their original propagation direction (the data signal is transmitted in the opposite direction to propagate in the original direction; for example, signal (f1, f3) from first side, is transmitted to propagate toward second side).

Regarding claim 2, Giles discloses amplifying an intensity of the data signals of a frequency band via the at least one influencing part (as shown in Fig. 1, Giles shows influencing part, such as amplifier (8), to amplify intensity of the signal).

Regarding claim 11 (as far as understood), Giles discloses optical multichannel optical fiber communications, as shown in Fig. 1, for the frequency band-dependent distribution and frequency band-dependent influencing of data signals of a WDM system, the method comprising the steps of:

the WDM system having plurality of channels which propagate in a bidirectional interleaved fashion and have at least one frequency band between a first side and a second side (as shown in Fig. 1 and disclosed in col. 4, lines 50-63; the signals are

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transmitted in bidirectional fashion; Fig. 2, shows that the signals, transmitted on the bidirectional line (7), which comprises of bidirectional amplifier (8), are odd channels (f1, f3) and even channels (f2, f4). Since the signals are odd and even traveling in bidirectional fashion it is considered as bidirectional interleaved; the signals are transmitted between first side, where transmitter (1) and receiver (2) are located, and second side, where transmitter (4) and receiver (5) are located; the signal have at least one frequency band, such as (f1, f3)) comprising at least one branch having at least one influencing part provided per frequency band (since the bidirectional amplifier (8) influence the signal by increasing its intensity, the bidirectional amplifier is considered as an influencing part) and precisely one interleaver (in col. 8, lines 5-7, Giles discloses interleaved pairs of 3-dB coupler that interleaves the signals (f1, f3) and (f2 and f4), which is known as an interleaver).

Regarding claim 15, as shown in Figs. 1 and 2, Giles shows at least two frequency bands are provided (for example, (f1, f3) and (f2, f4) are two frequency bands).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giles (US Patent No. 5,533,741) in view of Wysocki et al (US Patent No. 6,396,623).

Regarding claim 12, Giles disclose multichannel optical communications, as shown in Fig. 1 comprising influencing part (8) which is an amplifier and differ from the claimed invention in that Giles does not specifically disclose that the influencing part comprises a multi-stage amplifier. However, multistage amplifier is well known. Wysocki et al is cited to show such well known concept. In col. 3, lines 52-53, Wysocki et al teach multiple amplifier stages. It is well known that optical signal quality degrades as it travels along a transmission medium such as optical fiber. Since wavelength division multiplexed signal may comprise of different bands, a single amplifier may not uniformly amplify the signals within the different bands. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide multiple stages amplifier as taught by Wysocki et al to the communication system of Giles. One of ordinary skill in the art would have been motivated to do such in order to increase amplifier bandwidth and strengthen signal level of all the different bands within the WDM signal.

Regarding claim 13, in view of the rejection of claim 12, Wysocki et al further disclose that the amplifier contains at least one optical waveguide which is doped with erbium (see col. 3, lines 52-56).

Regarding claims 3 and 14, Giles disclose multichannel optical communications, as shown in Fig. 1 comprising influencing part (8) which is an amplifier and differ from

the claimed invention in that Giles does not specifically disclose that the influencing part comprises a dispersion-compensating fiber. However, dispersion compensator is well known. Wysocki et al is cited to show such well known concept. In col. 3, lines 61-63, Wysocki et al teach that amplifier module may also have dispersion compensator to compensate dispersion. It is well known that characteristic of optical transmission medium such as optical fiber, influence quality of the optical signal. Impurities within the fiber, causes the optical signal to disperse. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide dispersion compensator for compensating dispersion of the optical signal, as taught by Wysocki et al, to the system of Giles. One of ordinary skill in the art would have been motivated to do such in order to maintain shape of optical pulse and hence reduce interference between the optical pulses.

7. Claims 4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giles (US Patent No. 5,533,741) in view of the admitted prior art (see disclosure, as originally filled, on page 3, lines 1-12).

Regarding claim 4, as discussed in claim 11, Giles discloses multichannels optical communications as shown in Fig. 1, for the frequency band-dependent distribution and frequency band-dependent influencing of data signals of a WDM system comprising interleaving coupler for interleaving the odd ( $f_1$ ,  $f_3$ ) channels and even channels ( $f_2$ ,  $f_4$ ) and differs from the claimed invention in that Giles does not specifically disclose the interleaver have at least four inputs/outputs. However, as disclosed on

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page 3, lines 1-5 of applicant's disclosure, such interleaver is well known. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the multichannel optical communication system of Giles with four input/output interleaver as disclose by applicant. One of ordinary skill in the art would have been motivated to do such in order to provide a greater number of channels into the system and hence increase transmission capacity.

Regarding claim 6 (as far as understood), Giles shows band filters (on Fig. 2, Giles shows gratings (28, 29) or filters for bands (f1, f3)).

Regarding claim 7, Giles shows that distribution of data signals conducted to the influencing part, which is the amplifier (see claim 1), is carried out using circulators (on Fig. 2, Giles shows that signal conducted to the influencing part or the amplifier (8) is carried out using circulators (20, 21).

#### ***Allowable Subject Matter***

8. Claims 8, 9, 16 and 17 are allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

9. Claims 5 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Aina et al (US Patent No. 6,160,660) is cited to show bidirectional optical transmission system for dense interleaved wavelength division multiplexing.

Wu et al (US Patent No. 6,426,816) is cited to show bidirectional transmission system comprising of odd and even channels.

Fee (US Patent No. 6,658,210) is cited to show interleaved bidirectional WDM channel plan.

Han et al (US Patent No. 6,704,143) is cited to show interleaver and de-interleaver (see Fig. 5).

Cao et al (US Patent No. 6,778,780) is cited to show WDM channel separators.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272--3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS

October 9, 2004

*David Singh*